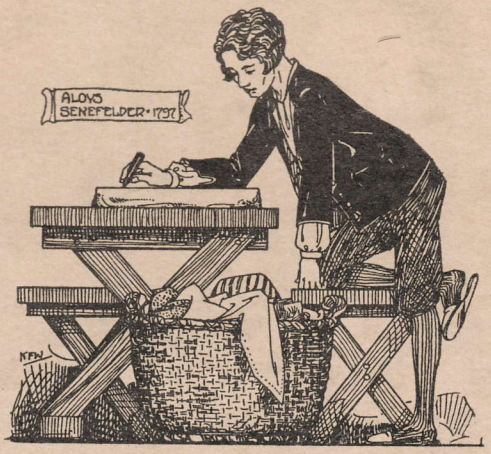
The LITHOGRAPHER



SINCE GUTENBERG *early in the fifteenth century first invented movable type and the printing press, the printer has helped increasingly in the development of our social and political life. From those early days inventions one after another have been made which have so varied his work that today, instead of talking about the printer, we speak of the compositor, the engraver, the photo-engraver, the electrotyper, the stereotyper, the pressman, the bookbinder. The one trade has become several trades, with different apprenticeship requirements, duties and wages. These will be described in a series of booklets, of which* THE LITHOGRAPHER *is the sixth.*

CHICAGO BOARD OF EDUCATION

CHICAGO BOARD OF EDUCATION
Office of the Superintendent of Schools
WILLIAM McANDREW, *Superintendent*

TRADE BULLETIN No. 7

THE LITHOGRAPHER

Sixth in a series of Bulletins on

THE PRINTING TRADE

The Compositor
The Bookbinder
The Pressman
The Photo-Engraver
The Stereotyper—The Electrotyper
The Lithographer

VOCATIONAL GUIDANCE
BUREAU

ANNE S. DAVIS, *Director*

WILLIAM J. BOGAN
Assistant Superintendent in Charge

CHICAGO

THE LITHOGRAPHER

THE discovery of the fundamentals of the art of lithography makes an interesting story. It is related that about 1796 Aloys Senefelder, a Bavarian actor, who had taken up the art of printing as a pastime, chanced to write out his laundry list with a greasy crayon on a convenient printing stone. Later it occurred to him to attempt to take an impression of this writing from the stone. After some experimentation he succeeded in doing this, thereby making a discovery that was destined to be of great importance to the printing industry.

From this humble beginning a distinct method of printing has developed, which is of use both in purely artistic printing and in commercial work. Many famous artists have used it as a medium of expression and its commercial use has reached large proportions.

Methods of lithography have been so perfected and improved that by means of adaptations of its principles it is possible to produce copies of drawings of many kinds, from the fine-line details of bank note paper and stamps, to highly artistic copies of paintings in color, as found in illustrations in magazines, and even the great twenty-four sheet posters displayed on enormous bill boards. Perhaps no single method of printing can produce such a wide variety of product.

PRINCIPLES USED IN LITHOGRAPHY

In order to get an idea of lithography as an occupation, it is necessary to understand something of the technical processes involved. On first view, these appear to be very complicated, but further examination shows the underlying principles to be fairly simple.

Described briefly, the method of using Senefelder's discovery, and coupling with it the principles of the antipathy of grease and water, consists of the following steps:

A copy of the design to be lithographed is made in greasy ink on the surface of a specially prepared stone, or plate of zinc or aluminum. When a sheet of paper is smoothly pressed down upon this surface, the inky pattern is transferred to it, making a *lithographed copy*. Several such copies or impressions can thus be taken before the ink is exhausted.

In order to re-ink the pattern, so that still more impressions can be taken, the stone or plate is flooded

with water. This water adheres only to those portions of the surface which are not inked, the greasy pattern repelling the water. Since the stone or plate is now damp, greasy ink can be applied to the surface and it will stick only to those portions which have formed the previously inked pattern. By repeated watering and inking a great many impressions can be taken from the stone or plate.

At first all lithographic work was done on a special type of limestone imported from Bavaria, cut in slabs, varying in thickness from two to five inches. The pattern was placed on the stone either by drawing in crayon, or if fine detail work were desired, by engraving with a sharp pointed tool and then inking in.

MODERN IMPROVEMENTS AND CHANGES

As the art became more perfected and better understood, modern substitutes for the stone came in the form of aluminum and zinc plates which were "grained" to resemble the stone. This was of great importance, since one of the drawbacks to the use of lithography was the expense attached to the quarrying and shipment of the stone from Bavaria. Also new methods of transferring or copying the pattern onto the plate have been developed. One of the most important of these is the photographic method called photo-lithography.

Present-day lithographic houses are highly specialized. Some do only commercial paper, such as bank notes, checks, drafts, etc. Some specialize in illustrations and covers for magazines, and in advertising illustrations. Still others turn out only gaily colored post cards. Several firms confine their efforts to making twenty-four sheet posters and other display advertising. Each firm, consequently, uses the method best suited to the production of its specialized product. It is, therefore, important to understand all of these modern improvements, when choosing in what type of lithography to become adept.

All lithographic houses employ one or more of the three rather distinct processes which are described below:

STONE ENGRAVED LITHOGRAPHY—*Used extensively for the production of fine detail, black and white, commercial paper such as letter heads, bank notes, and the like.*

PHOTO-LITHOGRAPHY—*Used largely for color work such as is found in illustrations, magazine covers, post cards, can labels, etc.*

Sample of Poster Crayon Lithography.

CRAYON LITHOGRAPHY—*Used for color work such as is found in bill board posters, and often in illustrations.*

SPECIFIC TRADES FOUND IN LITHOGRAPHY

Not only do the modern lithographing firms specialize as to method and product, but the men found working in them specialize on a certain detail of the work. Consequently, the workers are divided into the following general groups:

Artists who correct, retouch, and add to the original design or photograph sent to the firm, so that it is in shape to be worked on by a lithographic process.

Reproducers who copy the original design onto the stone or metal plates, either by a hand process, such as engraving or drawing, or by a photographic process.

Proofers who take trial impressions to test the work of the reproducers or copyists.

Transferrers who, in order to preserve the original plate for future use, transfer the design once or many times to a second plate or press plate which is used on the presses.

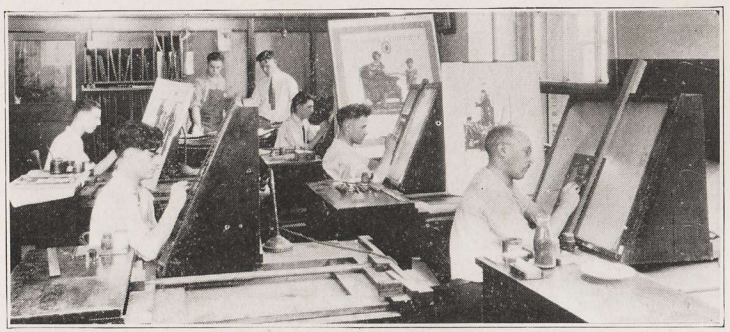
Litho-pressmen who operate the presses.

Plate grainers and preparers who grind the surface of the plates so that the water and ink will have the right sort of base.

WHAT THE SPECIALIZED WORKERS IN LITHOGRAPHY DO.

MAKER OF THE ORIGINAL COPY. It is an interesting fact that the *artist* or *photographer* who produces the original drawing, painting or photograph to be lithographed, is in some concerns classed as a lithographer. He may be employed by the lithographing firm, or he may be an independent worker. He should have knowledge of the processes to be used in the reproduction of his design, so as to adapt his work to them.

RETOUCHING LITHOGRAPHIC ARTIST. The subject to be reproduced may be in the form of a photograph, painted picture, or pencil or pen and ink drawing. Often, whether this is produced by the artists in the firm or sent in from outside artists, it must be retouched before it goes on to the other workers. The *retouchers*, therefore, are among the first workers to handle the "subject." These artists work at benches on which they have the usual tools of the artist; they paint out features not desired, or paint in others which do not occur in the original. Often the flags, automobiles, street cars and beautiful surroundings shown in the post cards picturing hotels and business firms are added by the retouching artist. Certain parts of the detail are heightened, and other parts diminished in tone.



Retouching Artists

Artists often have to retouch the negatives, especially where photo-lithographic work is done. The photographic negative is placed on a sheet of ground glass, which is mounted in a special frame on an easel or table, with a light suspended behind it. The artist thereby sees the negative against the light, which makes all details show very clearly.

Lettering a Poster

Sample of Direct Process Offset Printing.
Color Separation by Camera.

LETTERING ARTISTS. Some firms employ special artists who do only *lettering* work. They take the subject as prepared by the original artist and add the necessary lettering.

REPRODUCERS OR COPIERS OF THE ORIGINAL DESIGN. When the original design has been completed and approved, and retouched if necessary, it must be copied or reproduced on a stone or metal plate. There are several ways of doing this. The three most usual methods, corresponding with the three processes listed on pages 4-6 are carried out by specialized workers, as follows:

The Stone Engraver. The trade of the *Stone Engraver* is one of the most interesting and exacting of all the trades found in lithography.

Most of the stone engraver's work is done seated at a table or bench on which are placed the *stone* and the tools which he needs in his work. He receives the copy and must first *transfer* the outlines to the stone so that he can engrave it. One of a number of ways of doing this is to place a piece of *celluloid* or *tracing paper* over the original design and trace the outline with a steel needle. The lines thus cut are filled with red chalk. The celluloid or tracing paper is then placed face down on the stone and the chalk marks are rubbed off onto the stone.

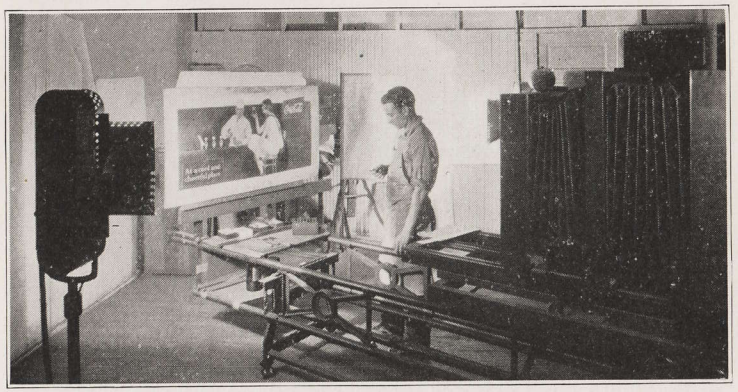
Then with the use of a *diamond-pointed* tool and very sharp-pointed *steel needles,* the worker *engraves* or cuts the design into the finely grained surface of the stone. Many of the lines are so fine and close together that he is forced to work under a magnifying glass, in order to see better what he is doing. He sometimes covers the stone with lamp black so that the scratches stand out more distinctly.

Lined backgrounds, shaded letters, and high light effects are put on by the use of *litho-ruling machines.* The letters are first outlined, then a specially prepared coating is brushed over the entire surface and left to harden. The stone is then placed in the machine and a ruled tint is put over the whole engraving. The ruled tint consists of very fine lines drawn parallel to each other. The design to be created is "stopped" out with asphaltum, put on with a fine brush and left to harden. The entire stone is then etched with a light acid solution and finally washed.

Since the work of the stone engraver is extremely exacting, and the preparation of even small designs requires several days' work, the developers of lithography have sought out new ways of getting the design onto the plate. Stone lithography is still used, however, and will, from all appearances, continue to be an important part of the trade.

The Photo-lithographer. The *photo-lithographer* copies the original design onto the plate by means of one of the modern developments of lithography. He places the copy on a board facing the *camera,* adjusts the camera, turns on an arc light,

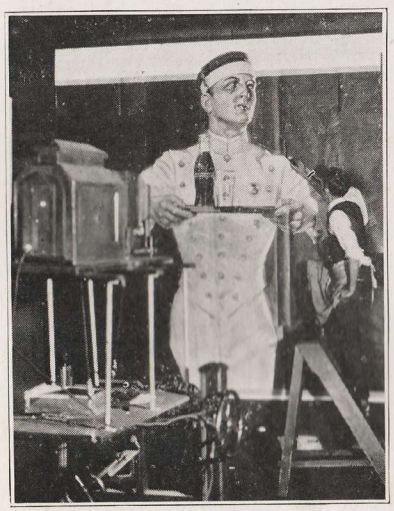
and makes the exposure on a *photographic plate.* He removes the plate from the camera and takes it to a dark room where he develops it by flooding it with the proper chemical solutions.



The Photo-Lithographer

If his copy consists of shaded or colored masses instead of black and white lines, he uses in the camera a screen consisting of a circular piece of glass across the face of which fine lines have been drawn, perpendicular to each other. This screen breaks the image up into fine dots. You will see these dots if you examine many of the newspapers and magazines. Sometimes they are not visible to the eye without the aid of a magnifying glass.

If a colored lithograph is to be made, the photo-lithographer uses *color filters* in the camera. A different filter and photographic plate is used for each color for which a lithographic plate is to be made.



Crayon Artist working with Stereopticon

The resulting *negatives* go to retouching artists for detail work, and then are printed directly on thin metal "key" plates.

The Crayon Artist. When the work does not require the fine line and detail work which is done by the stone engraver, it is often copied onto the stone or metal plate by an *artist* drawing with a *greasy crayon.* He sits at a table or desk on which are the plate and his tools, and with the original drawing propped up in front of him, he makes a crayon copy on the plate. Where the greasy crayon has touched the surface, ink will attach itself and water will not. These workers are found especially in houses where posters are produced.

Another *crayon* or *charcoal artist,* whose work is of special interest, is found where they make twenty-four sheet billboard posters. A small *stereopticon* slide of the original copy is prepared, the proper number of large sheets of white paper are tacked up on the wall of the room, and the slide is projected upon them, enlarging the subject to the required size and proportion. A crayon artist then mounts a ladder and traces the *image,* cast by the slide, in outline with charcoal or crayon. These copies are called *enlargement sheets,* and the outlines are transferred or rubbed off from them onto metal plates for other artists to draw in the necessary details. These metal plates constitute the "key" plates of the job.

Assisting in this work of reproducing the original copy onto the stone or metal plates are Black, Color and Ben Day artists. They work on the plates after the outlines have been placed on them by engraver, crayon artist or photo-lithographer.

The Color Artist. Where the work to be lithographed is in colors, the plates or stones are referred at some stage of the process to the *color artists.* There is a separate plate made for each major color to be lithographed by a press impression. It is surprising how many colors and shades can be produced by even two color plates. Take for example a job which calls for a red plate and a blue plate. On the finished product there could be red, blue, purple, and intermediate shades such as lavender, violet and wine color, according to the respective amounts of red and blue used.

Color Artists Working on Key Plates

The artists who secure these desired effects are the color artists. They receive the "key" plates, and with greasy crayon work in the necessary details of line and mass for each color. Certainly a very expert knowledge of how colors and tints are produced is necessary in this work.

The Ben Day Artist and Tint Layer. Sometimes portions of the color work are done by a *Ben Day Artist,* skilled in the use of

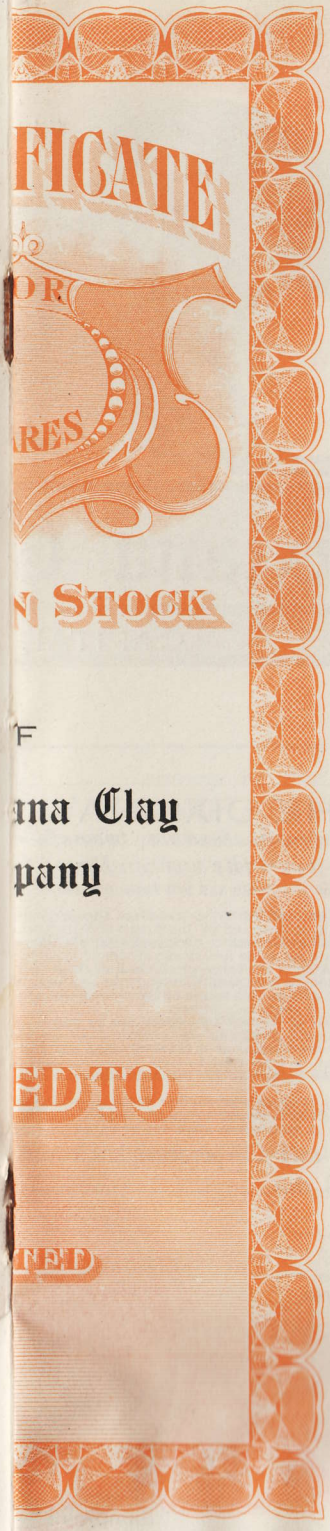
Ben Day screens—films on which different patterns are printed in relief. He places the plate on a copy board and stops out, or gums out, with gum arabic those portions of the design which are not to have the Ben Day shading. He then selects the film with the desired pattern and by means of a roller gives it a thorough coating of a specially prepared ink. The lines or shading on the film, being in relief, receive the ink readily. The inked film, mounted in a wooden frame, is placed in the Ben Day machine, a simple metal bar with adjusting devices, which is clamped to the copy board. The artist then forces the inked surface of the film against the metal surface which is to receive it, using an agate stylus, roller or other suitable tool. Later he washes the plate with gum solvent, which cleans off the plate, leaving the greasy inked pattern on the design.

The completed plates are lightly etched*—that is, washed with certain acids that tend to "fix the design" and open the pores of the plate not covered by the design so that the exposed surface will more readily absorb water—and they are then referred either to the PROOFER or the TRANSFERRER.

The Proofer or Prover. This worker takes *trial impressions* from the plates on a *proving press*. This process is of great importance in color work, since each color to be lithographed from a separate plate must be of the right density, so that, either clear or printed on another color, it will match that of the sketch or original copy. The proofer must also see that the different plates coincide exactly so as to secure correct *register* of the various details of the design.

The Proofer

* Etching is not a separate job in lithography. The work is usually done by the proofer or transferrer.



INCORPORATED UNDER THE LAWS OF THE STATE OF ILLINOIS

NUMBER 31

SHARES

The Dixiana Clay Company

CAPITAL STOCK

PREFERRED STOCK 250 SHARES
PAR VALUE $100.00 EACH

COMMON STOCK 250 SHARES
OF NO PAR VALUE

This Certifies That _____ *is the owner of*

_____ *shares of the COMMON capital stock of*

THE DIXIANA CLAY COMPANY,

of no par value, fully paid and non-assessable, transferable only on the books of the Corporation, by the holder hereof, in person or by attorney, upon the surrender of this certificate properly endorsed.

The preferred stock and the common stock and the rights and privileges of the respective holders thereof and the rights and obligations of the corporation in respect thereof shall be as follows:

(1) The holders of the preferred stock shall be entitled to receive from the surplus or net profits of the corporation dividends at the rate of eight (8%) per centum per annum, payable annually, semi-annually or quarterly, when and as declared by the Board of Directors.

(2) The dividends on the preferred stock shall be cumulative from and after the date of issuance, so that if at any period the full amount of such dividends accrued be unpaid, the arrears thereof shall be paid or funds sufficient thereunto set aside before any dividend is declared on the common stock.

(3) Upon the voluntary or involuntary dissolution of the corporation the holders of such preferred stock shall be entitled to receive and shall be paid the full par value of their shares and any and all dividends accrued (including proportionate fractional dividends for any unexpired portion of any dividend period not wholly expired) and unpaid thereon out of the assets of the corporation, and after the payment of such sums any and all assets of the corporation then remaining shall be available for distribution pro rata among the holders of the said common stock, according to the number of shares held by each of them respectively.

(4) All or any part of the preferred stock shall be subject to redemption by and at the option of the Board of Directors of the corporation, at any time after date of issuance, at 105% of the par value thereof and any accrued and unpaid dividends, upon thirty days' notice mailed to the holders of the shares intended to be so redeemed, at their respective addresses as the same shall appear upon the stock books of the corporation. If it is intended at any time to redeem less than all of such preferred stock then outstanding, shares shall be selected for redemption in such manner and by such method as shall be from time to time determined by such board.

(5) The holders of the preferred stock and the holders of the common stock shall have equal voting powers; that is to say, one vote for each share of stock held by each of them respectively.

Without action by the stockholders, the shares of stock without par value may be issued by the corporation from time to time for such consideration as may be fixed from time to time by the Board of Directors thereof, and any and all such shares so issued, the full consideration for which has been paid or delivered, shall be deemed full paid stock and not liable to any further call or assessment thereon, and the holders of such shares shall not be liable for any further payment thereon.

IN WITNESS WHEREOF, the said Corporation has caused this Certificate to be signed by its duly authorized officers, and its Corporate Seal to be hereunto affixed, this _____ *day of* _____ *A. D. 192*_____

_____
Secretary.

_____
President.

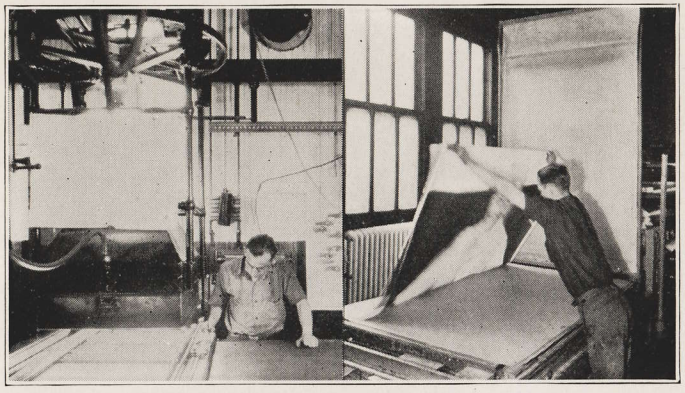
Corporation Banknote Co., Chicago

SPECIMEN

Sample of Stone Engraving.

Often the designs are very small, and it would be a foolish waste to run a press measuring five or six feet across to print one small plate. This is avoided by "transferring" many small designs requiring the same handling to the same press plate, so that the press may be printing any number of small designs at the same time.

The Transferrer. The *transferrer* places the original engraving in a *transfer press* and covers it with a specially prepared paper which attracts the ink from the original. He adjusts the press, and by means of a lever, "pulls" it, running the material between closely-geared rollers. He then removes the transfer paper which has taken on the image, and places it face down on another plate. This is pulled through the press, and the image is thereby transferred to the new plate.



Transferring with an Automatic Transfer Machine

Transferring by Hand Transfer Press

Where color work is done, several outline imprints are thus made on several sheets of paper, and from the paper transferred to metal plates. These plates are then referred to the color artists as "keys" for their work, one plate for each color.

The plates are now sent to the presses.

THE LITHO-PRESSMAN. The *litho-pressmen* operate three distinct types of presses. They are the *Flatbed one-cylinder press* for stone work, the *Rotary two-cylinder press* for one or two colors, and the *Offset three-cylinder press*. The first two of these presses make direct impressions on paper, while the third makes an impression first on a *rubber blanket* and then transfers it from the blanket to the paper.

The Flatbed pressman operates a flatbed cylinder press, which prints from surfaces that attract the greasy lithograph inks, instead of from raised type or designs. The plate is a *stone* prepared chemically or by etching by the lithographer or engraver. Water and ink rollers pass over it in such a way as to

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For value Received ____ hereby sell, assign and transfer unto

_____ Shares

of the Capital Stock represented by the within Certificate, and do hereby irrevocably constitute and appoint

_____ Attorney

to transfer the said stock on the Books of the within named Company with full power of substitution in the premises.

Dated _____ 19__

In Presence of

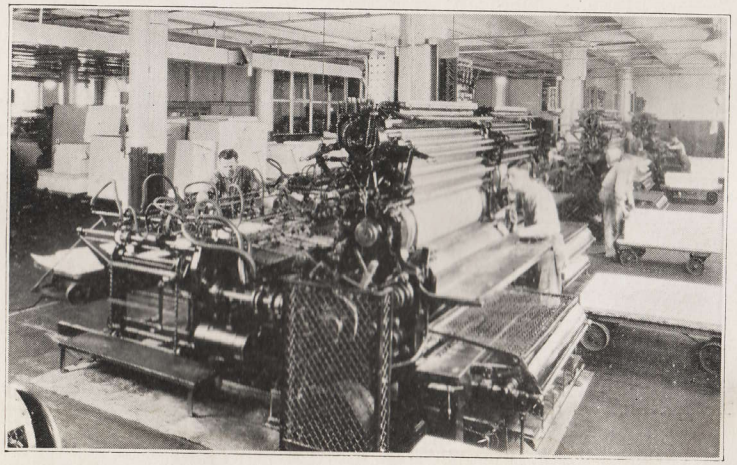
NOTICE THE SIGNATURE TO THIS ASSIGNMENT MUST CORRESPOND WITH THE NAME AS WRITTEN UPON THE FACE OF THE CERTIFICATE IN EVERY PARTICULAR WITHOUT ALTERATION OR ENLARGEMENT OR ANY CHANGE WHATEVER

leave dry the design which must absorb the ink and make the impression. The litho-pressman must know how to adjust the stone plate and how to adjust and regulate the ink and water rollers. He must also know how to mix colors and how to keep them uniform as the press operates, since much color work is done on this press.

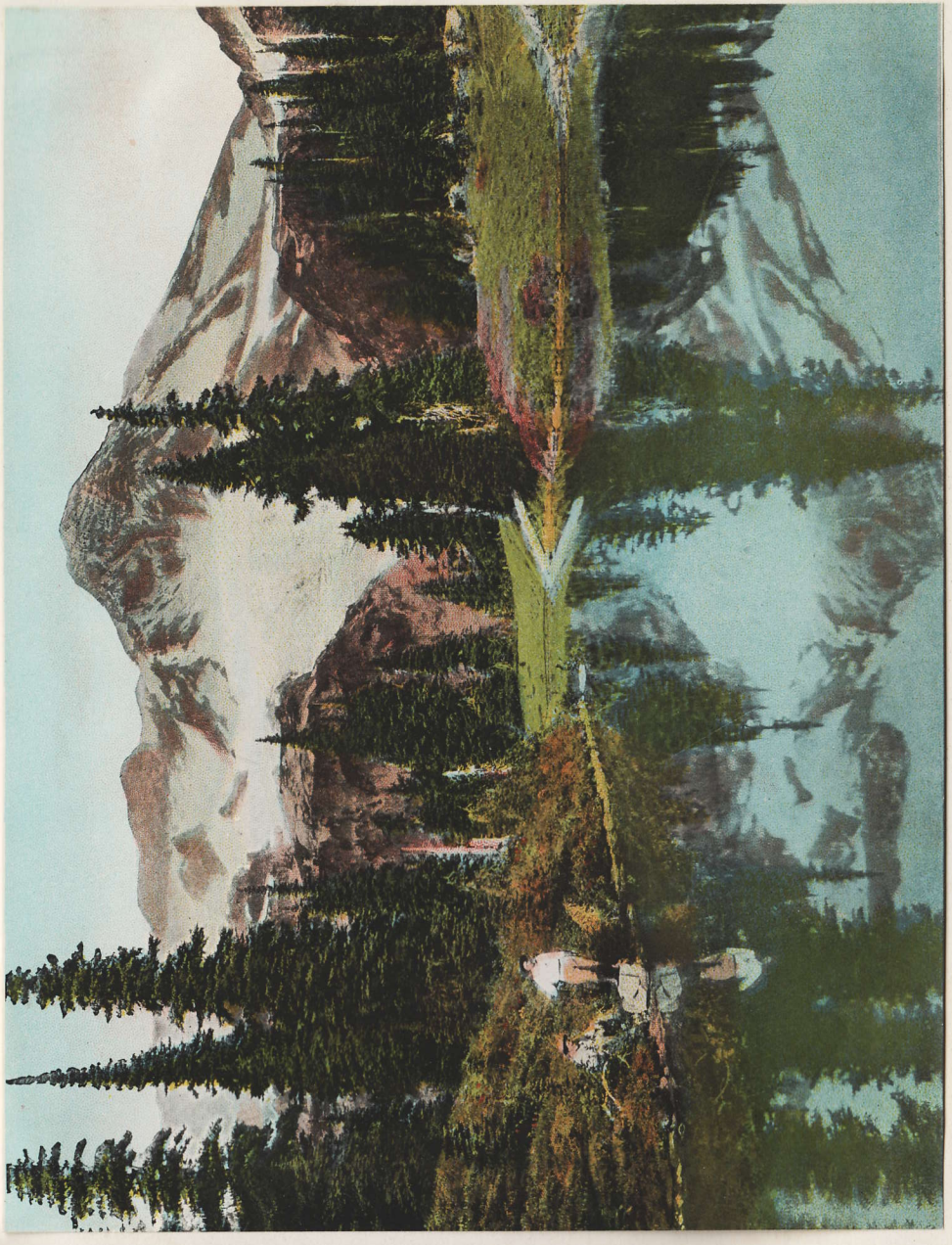
The Rotary Pressman. The *rotary pressman* lithographs from surfaces that attract greasy lithographic inks, using plates prepared as previously described, and fastened around the *cylinder* adjacent to the *impression cylinder* which carries the paper. He must understand adjustment of cylinders to water and ink rollers, locking on plates, securing register, mixing and regulating ink, water and acids, and he must be able to keep the work uniform and clean. The rotary press is used mostly for posters and display advertising material.

The Offset Pressman. The *offset pressman* operates another type of rotary press. The plates from which the lithographing is done are made of zinc or aluminum sheets, prepared as previously described and curved over the cylinder form. Instead of making the impression directly on the paper as in other presses, this plate transfers it to a second cylinder covered with a *rubber blanket,* which in turn transfers it to the paper. The offset pressman must understand the careful adjustment of the three cylinders and the ink and water rollers, all of which must be kept very clean. He must know how to mix colors used in most of the work and keep them uniform as the press operates.

THE PLATE GRAINER AND PREPARER. Before any design is placed upon the plates or stones they must first undergo a process known as "graining." This consists of roughening the surface,



The Pressroom in a Lithographing Plant



Sample of Offset Process in Ben Day and Stippling.

The Plate Grainer

thereby giving it a texture which will attract and hold water and ink. Sometimes this is done by hand, in which case *pumice* and such substances are applied to the surface until the desired effect has been obtained.

The metal plates are usually grained in a machine which the *plate grainer* tends. This machine consists of a flat, mechanically agitated trough, in which the plate is placed and covered with marbles, steel balls, water, pumice, or sand. The machine is set in motion. The result is a surface similar in properties to that of the stone.

WHERE JOBS IN LITHOGRAPHY ARE FOUND

Lithography is one of the most highly localized of the various occupations. Three states, Nevada, Vermont and Wyoming, according to the 1920 Occupational Census have no lithographers at all. Thirty-five states have less than 100 lithographers each. The states having the greatest number of lithographers are Ohio and Illinois, which have between 700 and 800, and New York, which has over two thousand. Even within the states we find the occupation localized in the larger cities. For example, in 1920, out of the 8,222 lithographers in the entire United States, 4,538 men and 103 women are employed in New York City and its environs, Chicago* has 687 men and 2 women lithographers. Baltimore, Cincinnati, Philadelphia, Rochester, N. Y., come next with between 200 and 300 each. Eight other cities have between 100 and 200 each. All other cities have either less than 100 or no lithographers at all.

Consequently a boy contemplating taking up lithography will find beforehand that his choice of residence is restricted to a few large cities.

* It is estimated that in 1926 there were from 900 to 1000 lithographers in Chicago.

OPPORTUNITIES FOR LEARNING THE TRADE IN CHICAGO

Most of the lithographic plants in Chicago train boys in the various branches of the trade. Apprenticeship regulations vary considerably from shop to shop, both in the union and in the open shop groups.

There are two organizations here which are interested in the training of apprentices: The Lithographers' National Association which runs on the open shop plan, and the Amalgamated Lithographers of America, Local No. 4, to which the workers in the union shops belong.

APPRENTICESHIP. **Contracts.** Some shops make signed agreements with the apprentice and his parents concerning the terms of his apprenticeship. Others have verbal understandings. The agreement or understanding should contain definite statements concerning the length of the apprenticeship, the pay, and the type of training.

Term of apprenticeship. *In the union shops* the term of apprenticeship is four years, except for the artist, engraver, and transferrer, who serve five years. After the preliminary thirty days' trial, the union makes out a certificate of apprenticeship for the boy, which becomes permanent after a probationary period of six months if the boy has shown that he is adapted to the trade. He then pays an initiation fee of $15 and a mortuary assessment of $6 and is thereby entitled to receive mortuary benefit. Sick benefit is also provided. After this six months probationary period the apprentice has four years of training in the branch of lithography which he has chosen. At the end of the four years' training period, the apprentice becomes a journeyman if his work meets the approval of the employer and the union organization.

In the open shops the term of apprenticeship for pressmen, transferrers and proofers is four years, often with a six months probationary period. The artists and engravers are apprenticed for five years. Many shops state that the length of training depends upon the boy's ability and effort. Credit is given for school training in such subjects as art, and the boy becomes a journeyman when in the opinion of his employer he can do the work.

Ratio of apprentices to journeymen. In the union shops the ratio is one apprentice to five journeymen, with the exception that one apprentice is allowed in every Process Art Department, even though there be but one journeyman.

EVERYDAY BANANA RECIPES

Bananas in Ginger Jelly—Salad

2 tablespoonfuls granulated gelatine; 2 tablespoons lemon juice; 1 cup sugar; 3 tablespoonfuls ginger syrup; ¼ cup cold water; 2 cups boiling water; few grains salt; 4 whole bananas; small jar maraschino cherries.

Preparation: Dissolve gelatine in cold water for two minutes. Pour 2 cups boiling water over dissolved gelatine. Stir thoroughly, being sure all gelatine is dissolved. Add ginger syrup, sugar and lemon juice. Dissolve. Strain jelly through cheesecloth.

Rinse mold or bread pan in cold water. Pour jelly in this and place in refrigerator. When gelatine starts to set, and is beginning to be firm, press the four whole bananas into it, adding the cherries for decoration. Press cherries and bananas into jelly. Place mold in refrigerator for several hours.

SERVICE

Set mold in pan of hot water for a minute, then turn out onto a flat plate or platter. In serving cut in slices, place on lettuce leaves on a salad plate and garnish with thick mayonnaise dressing.

Baked Apple with Bananas

6 large-sized apples; 1 cup corn syrup; 1 tablespoon butter; 1½ ripe BANANAS; 6 marshmallows.

Wipe, pare, and core the apples. Place in a pan and add the syrup and butter. Simmer slowly, turning the apples frequently until they are tender yet hold their shape. Remove to a casserole and insert one-quarter of a banana in each apple. Place a marshmallow on top of each apple. Pour the syrup around them and bake at 400 degrees F. until the marshmallows are puffy and brown. Serve at once.

Baked Bananas

Remove skins from six firm bananas and cut in halves lengthwise. Put in a shallow granite pan or on an old platter. Mix two tablespoons melted butter, one-third cup sugar, and two tablespoons lemon juice. Baste bananas with one-half the mixture. Bake twenty minutes in a slow oven, basting during baking with remaining mixture.

Bananas in Ginger Jelly Salad

Sample of Four-Color Process Lithography made from Photographic Positives and Negatives Combined with Text.

In the open shops the ratio is one apprentice to every three journeymen.

Type of training. In both the union and the open shops the form of training is determined by the employer and is directed by the foreman of the branch in which the boy is apprenticed. He learns by helping the journeymen and by being shown the proper technique by the foreman and other workers. Often he is first employed as a floor boy, or errand boy, for general help and odd jobs. If he is a union apprentice he can profit by work in the Educational Department conducted by the union at its headquarters for those who wish to become proficient in Litho-Photography or Process Art work.

Some open shops maintain special provision for the instruction of apprentices. In the Lakeside Press the lithographic apprentices work part-time in the training school and part-time under the foreman of the particular branch which they have chosen. Several other open shops have set aside a space where the artist apprentices, seated at study benches, are instructed by a special teacher on material about to go to the presses.

Many firms either require or recommend that the boys in certain branches attend art class.

Pay. As stated by *the open shops*, the average rate of pay runs from $12 a week during the first six months to $26 a week during the eighth six months, the weekly wage being raised $2 every six months. Some firms report $35 a week at the end of the four years. A few of these firms give a bonus as high as $400 if the boy successfully finishes his apprenticeship; this is included in the contract, if given.

Pressmen, as a rule, receive higher wages, starting at not less than $16 as helpers and feeders, and becoming apprentice pressmen.

Boys with art class training secure higher beginning pay and progress more rapidly.

In union apprenticeship the pay of the first six months depends upon the arrangement between the employer and the apprentice. Beginning with the second six months, the difference between the wage then being paid the apprentice and the minimum wage being paid journeymen in the same branch is divided into eight equal parts and one-eighth of this difference is added each six months to the apprentice's pay.

Journeymen *in both union and open shops* receive wages within the following limits: Artists—$50 to $70 a week; Engravers—$55 to $65; Grainers—$40; Pressmen—$48 to $65;

Proofers—$55 to $65; Transferrers—$50 to $65. Foremen are reported to get as high as $100 a week.

TRADE SCHOOLS. For information concerning trade schools, consult the adviser at your school, or visit the Vocational Guidance Bureau, 460 South State Street, Chicago.

QUALIFICATIONS NEEDED FOR ENTERING THE TRADE

AGE. There are no jobs in lithographing houses for boys under 16 years of age, except those of office and errand boys. Some firms take on a boy as an apprentice as soon as he reaches 16 years of age, others delay this until he is 17 years of age, while still others are furthering the tendency by insisting that the boy be 18 years of age before they will make a definite apprenticeship contract with him.

SEX. The large majority of lithographers are men. Women lithographers are rare, there being only two listed in Chicago in the 1920 census.

PERSONAL QUALIFICATIONS. An ideal boy to take up the trade would be one who has definitely decided to learn a trade, who is willing to serve an apprenticeship, who has had some general or preferably technical high school work, in which he has discovered taste and ability in both drawing and in shop, and has perhaps had one or two semesters of printing and found it of considerable interest.

This brings out an interesting fact about lithography—that the two most desired assets for the trade are artistic ability and mechanical skill. Certain of the occupations found in lithography require mainly artistic skill, such as the work done by artists, retouching artists, stone engravers, crayon and color artists, and Ben Day artists and tint layers. In addition to artistic skill, mechanical skill is needed in the work of the photo-lithographer, proofer, transferrer, and litho-pressman. Mechanical skill alone is needed in plate graining and preparing.

Unusually good and keen eyesight and steady control of hands are needed, especially by the stone engraver.

The candidate should be in good physical health, and of fair size and strength.

YOUR FIRST STEP

The employers and schools feel that it is wise for boys wishing to become lithographers to stay in school as long as possible. The boy with a broad education before starting his apprenticeship is preferred. While in high school take such courses as chemistry and physics since they will give you the principles upon which lithographic printing is based. Take also as much as you can of drawing, both freehand and mechanical, and shop, preferably print shop. These special subjects together with the usual high school subjects, should give you a fine educational background. After your apprenticeship you should head for an executive position, with such a start.

The boys' technical course in high school contains all of the recommended subjects, though many of them may be taken as electives in the general course. Consult with the adviser in your school both about your school course and about how to proceed after finishing it.

The various organizations which are interested in the training of apprentices will usually help you to find an apprenticeship opening. The Vocational Guidance Bureau of the Board of Education will also advise and assist in placing boys interested in the trade.

LYLE H. WOLF,
Vocational Adviser.

Acknowledgment for illustrations used in this booklet is made to the Edwards and Deutsch Lithographing Co. and to R. R. Donnelly & Sons Co.

Edwards & Deutsch Lithographing Co.
- Lettering A Poster
- The Photo-Lithograper
- Crayon Artist Making Enlargement Sheets
- Color Artists Working on Key Plates
- Transferring by Hand Transfer Press

R. R. Donnelly & Sons Co.
- Retouching Artists
- Proofers
- Transferring with an Automatic Transfer Machine
- The Pressroom in a Lithographing Plant
- The Plate Grainer

For lithographed sheets bound in the booklet we are indebted to the Corporation Supply Co., R. R. Donnelley & Sons Co., Curt-Teich & Co., The National Printing and Engraving Co., and the Lithographers' National Association.

SOME BOOKS TO READ

CONCERNING THE DISCOVERY AND HISTORICAL DEVELOPMENT OF LITHOGRAPHY

BERRI, DAVID G. *The Art of Lithography;* D. G. Berri London, 1879. (C-763B45).

HULLMANDEL, CHAS. J. *The Art of Drawing on Stone;* C. Hullmandel, 1824. (C-L763H87).

RAUCORT, ANTOINE. *A Manual of Lithography;* Longman, Rees, Ome, Brown, Green and Longman, London, 1832. (C-763R19).

SENEFELDER, ALOYSIUS. *The Invention of Lithography;* R. C. Ackerman, London, 1819. (C-L763S475), (P-V619).

This is the discoverer's own story of his invention of lithography and his directions for utilizing the principles in printing.

CONCERNING THE USE MADE OF LITHOGRAPHY BY ARTISTS

CURTIS, ATHERTON. *Some Masters of Lithography;* Appleton and Co., 1897. (C-763C94).

PENNELL, JOSEPH. *The Graphic Arts;* The University of Chicago Press, 1921. (P-K29339).

WEITENKAMPF, J. *American Graphic Art;* MacMillan, 1912. (P-K10634).

BOOKS GOOD IN SHOWING COLOR TECHNIQUE

PENNELL, JOSEPH. *A Liberty Loan Poster;* 1918.

This describes the complete process of making a poster, from the artist's original plan to the finished printed product.

TABOR-PRANG ART CO. *Art of Lithography;* Tabor-Prang Co., 1909. (C-L763A784).

BOOKS DEALING LARGELY WITH PHOTO-LITHOGRAPHY

GOODMAN, JOSEPH. *Practical Modern Metalithography;* Garden City Press, 1914. (C-762G62).

HORGAN, S. H. *Half-tone and Photo-mechanical Processes;* Inland Printer Co., 1913. (C-774H78).

BOOKS DEALING WITH THE ENTIRE PROCESS

RHODES, H. J. *The Art of Lithography;* D. Van Nostrand, 1914. (C-763R341), (P-K14232).

CUMMINGS, DAVID. *A Handbook of Lithography;* A. and C. Black, London, 1919. (C-763C91), (P-K14227).

HACKLEMAN, CHAS. W. *Commercial Engraving and Printing;* Commercial Engraving and Printing Co.

C refers to Crerar Library; P refers to Public Library.

PERIODICALS

LITHOGRAPHERS JOURNAL. Published by the Amalgamated Lithographers of America, 205 W. 14th St., New York City.

THE NATIONAL LITHOGRAPHER. Published by the National Lithographer Publishing Co., 150 Nassau St., New York City.

Appreciation is expressed to all those employers, members of employers' and employes' organizations, and other individuals, who gave generously of their time, not only in furnishing the necessary facts, but also in reading the manuscript and giving helpful editorial comment.

TRADE BULLETIN SERIES

1. The Beauty Culturist
2. The Compositor
3. The Bookbinder
4. The Pressman
5. The Photo-Engraver
6. The Stereotyper and the Electrotyper
7. The Lithographer

The Compositor

SINCE GUTENBERG *early in the fifteenth century first invented movable type and the printing press, the printer has helped increasingly in the development of our social and political life. From those early days inventions one after another have been made which have so varied his work that to-day, instead of talking about the printer, we speak of the compositor, the engraver, the photo-engraver, the electrotyper, the stereotyper, the pressman, the bookbinder. The one trade has become several trades, with different apprenticeship requirements, duties and wages. These will be described in a series of booklets, of which* THE COMPOSITOR *is the second.*

Office of the Superintendent of Schools
WILLIAM McANDREW, *Superintendent*

TRADE BULLETIN No. 2

THE COMPOSITOR

First in a series of Bulletins on

THE PRINTING TRADE

The Compositor
The Pressman
The Bookbinder
The Photo-Engraver
The Stereotyper—The Electrotyper
The Lithographer

VOCATIONAL GUIDANCE BUREAU
ANNE S. DAVIS, *Director*
WILLIAM J. BOGAN
Assistant Superintendent in Charge

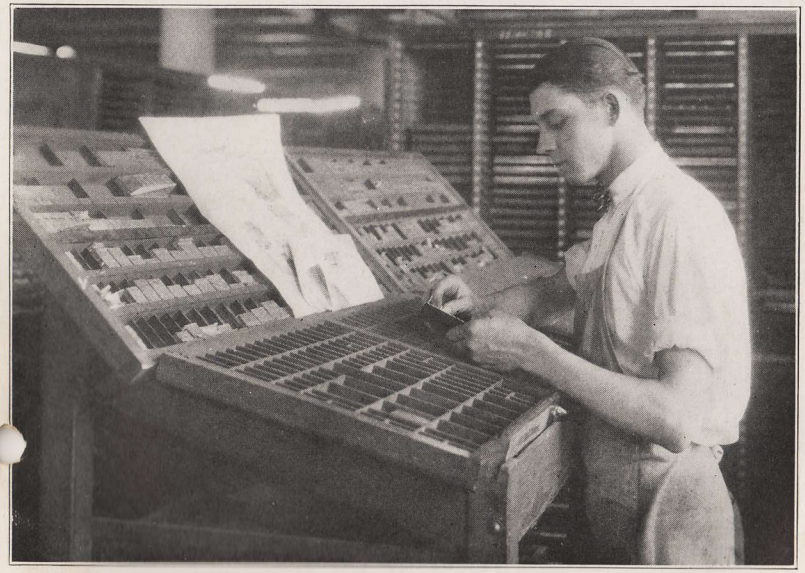
CHICAGO

THE COMPOSITOR

In the United States in 1920 there were, according to the Census, 140,165 compositors, of whom 128,859 were men and 11,306 were women. In Illinois in 1920 there were 14,035 men and 860 women compositors; and in Chicago, which is one of the big printing centers of the country, there were 10,506 men and 401 women, a total of 10,907 persons. Men in Chicago who know conditions, think, however, that these figures are too high. They estimate that there are about 7,500 compositors, of whom only 100 are women.

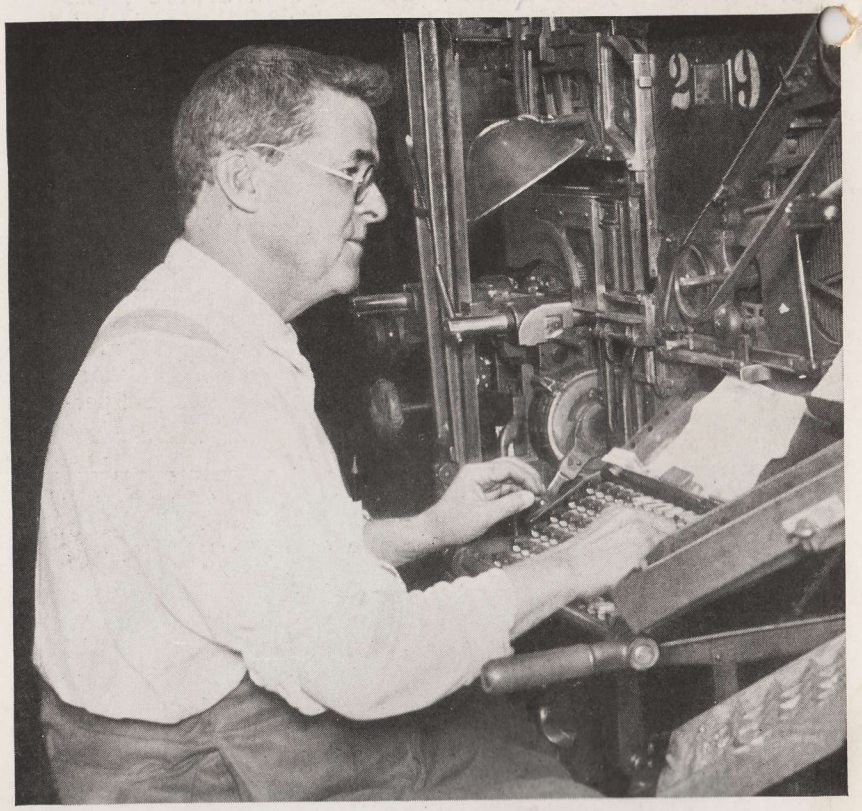
WHAT THE COMPOSITOR DOES

Because of many inventions the work of the compositor has become very complex. In general he is required to reproduce in type, the book, catalogue, advertisement, letterhead, or what not, which has been sent to him, written in longhand, or more frequently on the typewriter, and known as *copy*. The work of the various men described below may be combined and performed by one man.



The Hand Compositor

The Hand Compositor selects the type from the case, placing it in a small container, set the width of the line desired, which is held in the left hand, and known as the *composing stick*. When the stick is full he places the type in a tray known as the *galley*.



The Linotype Operator

The Linotype Operator sits in front of a large, complicated machine known as the Linotype, or intertype machine, with a keyboard containing some ninety keys. As a key is struck, a character or *matrix* is released and slides into an assembler, the length of the desired line. This later travels to a casting device where molten metal is forced against the face of the type, and the solid line of type or *slug* is formed.

The Monotype Operator uses a machine with a keyboard like a typewriter's; but by touching the keys he merely makes holes in a strip of paper, producing a perforated roll similar to that used in a player piano.

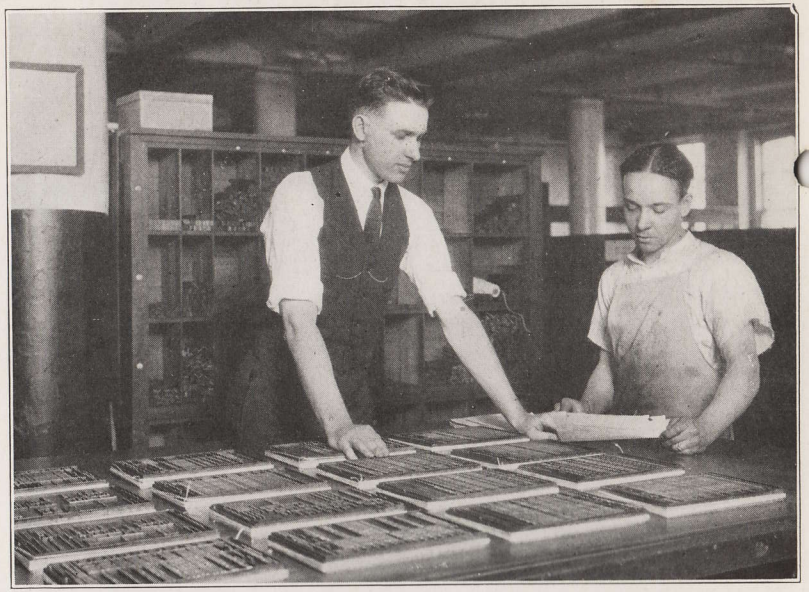
The Monotype Operator

The Monotype Caster operates the machine which casts the type. He adjusts the perforated paper, made by the monotype operator, so that compressed air passes through the holes, causing the type matrix and mold to be set in position, and the type to be cast and placed in the galley.

The Machinist adjusts and repairs the various typesetting machines. In smaller shops this work is done by the operators themselves, who have received special mechanical training, and who are known as machine-operators.

The Layout Man or Designer takes the order from the firm which wishes the work done, plans the specifications, arranges the spacing, the size of type and pictures to be used.

The Copyman or Copycutter works in a newspaper office where he takes the copy as it comes from the editorial room and assigns it to the various typesetters.



Preparing to Lock the Forms

The Bankman works at a table or counter where the *takes* as they come from the typesetters are placed. (A "take" is the amount of copy given out to one compositor to be set up in type. It may vary from a few lines to a week's work.) He places them in their proper order, numbers the galleys, and obtains a *proof* of the *set-up,* or requests one from the proof-press operator.

The Proofreader watches for errors in the proof as the copyholder reads from the copy to him. He makes the proper marks on the proof so that the typesetter may see where and what the corrections should be. The copyholder in union shops is not considered a member of the printing trade and does not become a proofreader, unless he acquires a knowledge of the printing trade.

The Make-up Man divides the type-matter into pages, inserts *cuts,* running titles, marginal and footnotes, and then ties them up.

The Stoneman next places the pages on a large smooth surface of iron or marble called an *imposing stone,* where a strong iron frame, called a *chase,* is placed around them. The spaces around the pages are filled with wood or metal blocks called *furniture,* the type is levelled down and the completed *form* locked, ready to go to the pressman.

WHERE THE COMPOSITOR IS TO BE FOUND

The compositor may be found at work in a printing house which publishes books, or in a job shop which prints all manner of things, such as catalogues, letterheads, cards, labels, circulars, and pamphlets. In 1921 in the city of Chicago there were 794 such establishments, according to the United States Census. He may work as a compositor in a music house, where music is set up. In 1921 Chicago reported 18 firms publishing music. He may be employed in establishments where newspapers or periodicals are printed, 388 of which Chicago has to its credit. These newspapers are printed not only in English, but in Polish, Italian, Bohemian, Swedish, German, Hebrew, and other languages.

Sometimes a bank, paper-box factory, candy factory or hotel will have a small printing department where one or two compositors are employed.

HOW TO BECOME AN APPRENTICE

In Union Shops.

In order to understand about apprenticeship, one should know about the organization of the trade. The employers in the job and book printing establishments who operate union shops, are organized in an association, called the Franklin Association of Chicago. The employers of the seven English daily newspapers, who operate union shops, are banded together into an association called the Chicago Local of the American Newspaper Publishers' Association. These two associations of employers, as well as a few publishers of foreign newspapers, work with the employes who are joined together into trades unions: those who set type in English, in Chicago Typographical Union No. 16; those who set type in Bohemian, in Chicago Bohemian Typographical Union No. 330; those who set type in Swedish, in Swedish Typographical Union No. 247; those who set type in German, in Typographia No. 9.

Two representatives each from the Franklin Association and from Chicago Typographical Union No. 16, form what is called the Joint Apprenticeship Committee, whose duty it is to select the apprentices in the book and job establishments, supervise them during the five years of training, and enforce all regulations which are agreed upon by the employers and employes. The apprentices in newspaper offices are selected

by the office in which they are to work, and are trained by the journeymen under the supervision of the foreman. Between five hundred and six hundred apprentices are under the supervision of this Committee.

The work of the all-round compositor is to be covered in the five years' training planned for in the agreement. The first year the apprentice is assigned to general work in the composing room; the second, he spends seventy-five percent of his time at hand composition and distribution and is given an opportunity to set reprint ads and job work. In those places where typesetting machines are used he may do bank work (page 6.) The third year he is employed seventy-five percent of his time on the floor at hand composition and distribution, when he is given an opportunity to set ads and job work from manuscript. He assists at make-up and imposition (page 6). The fourth year he is employed at least seven hours each day at hand composition, distribution, make-up and stone-work. The fifth year he is employed full time at floor work and may be allowed to set live matter on machines.

In the second year the apprentice in job and book establishments is required to begin his correspondence work with the Bureau of Education of the International Typographical Union, Indianapolis, Indiana. These lessons are in elementary composition, display composition, job composition, design and color, advertising, English, lockup and imposition, paper and printing inks, pamphlet binding, platen presswork, and proofreading. The lessons extend over the four years, and must be completed before the apprentice becomes a journeyman.

Additional training is frequently taken by the apprentice, in monotype operating and casting in a school maintained in Chicago by Typographical Union No. 16 and the Lanston Monotype Company; and in linotype operating, in a school maintained by the Mergenthaler Linotype Company.

This joint committee supervises two other occupations in the composing room, that of the machinist who looks forward to the repair of the typesetting machines; and that of the monotype runner, who may become a caster by acquiring the knowledge and passing an examination.

In union shops the scale of wages is determined upon by a Joint Scale Committee. In job and book offices and some newspaper offices the apprentice on the day shift begins at $15.25 a week and by increases every three or six months reaches $44.75 by the end of his fifth year. The night apprentice begins at $16.50 and at the end of his fifth year receives

$48. This scale is in effect until June, 1926. In other newspaper offices the wage for the first two years is set by the office, but the third year the apprentice must receive forty percent of the scale of the journeyman; the fourth year sixty percent; and the fifth year eighty percent. The scale for the day runner is also set, beginning at $15.25, and increasing to $38.25 a week for the last of the fifth year; and $16.50 to $41.25 for the night runner. Weekly hours in union shops, according to agreements, number forty-four.

Dues and initiation fee either do not exist or are low. The apprentice pays $25 for his correspondence lessons.

In Non-Union Shops.

There is another group of employers, which does not carry on negotiations with the employes. Many of these employers are banded together into an association, called the Open Shop Employing Printers' Association. It is difficult to make any statement concerning terms and conditions of apprenticeship in non-union shops in general, because conditions are not uniform and facts are frequently not obtainable. Two exceptions to this statement exist, however. One of the largest printing establishments in the city, The Lakeside Press, has a program by which future employes for its own establishment are trained. Employers in the Open Shop Employing Printers' Association support the Chicago School of Printing, which also has a definite training program.

The Lakeside Press has a day school for pre-apprentices, who number 104, and for apprentices, of whom there are 65 at the present time training as compositors. After six months probation an agreement is entered into, signed by the employer, the boy and his parents, guaranteeing the boy employment and instruction in the trade, and assuring the employer of the boy's regular attendance during his entire period of training. The pre-apprentice spends 19½ hours a week in school, studying applied arithmetic for printers, applied English, drawing and design, elementary science, and social studies. The other 25½ hours of the week he spends in the shop. After two years the boy enters upon his regular apprenticeship period when he spends five hours a week at academic work and the rest of the time in the shop. At the end of the seventh year he receives a diploma and may continue work in the plant, with the rank of journeyman. A graduate of the four-year high school course may complete his probationary period in three months and will be able to finish his apprentice work in three years.

The pre-apprentice at the present time is started at $5 a week and is raised every six months if his progress is satisfactory, until at the end of the two-year period he is receiving $10 a week. During the apprenticeship period he is raised periodically if his progress is satisfactory from $10 to $28 a week, which he receives the last six months before he becomes a journeyman. *A high school graduate* is paid $10 a week during his probationary period of three months, and then begins at $16. He also receives $28 a week for the last six months of his apprenticeship period. In addition the Lakeside Press places $1 a week in the bank for each apprentice from the beginning of the second year. This is held as a sort of security and inducement for the boy to complete his apprenticeship, and is given to him upon graduation. Fifty hours constitute a week's work in this establishment.

The Chicago School of Printing has a two-year day course for pre-apprentices, and a five-year night course for boys who have finished the pre-apprentice course and are working full time. The pre-apprentices, at the present time numbering 85, spend one week in the school and the next week in the shop of a co-operating printer. In school they are taught hand composition, English, spelling, syllabication, arithmetic, and social and industrial history. When the boy enters a shop full-time as an apprentice he is required to return two evenings a week to the school, where he is given advanced hand composition and related work. At the present time there are about 150 full-time apprentices in the school.

As a pre-apprentice a boy is paid $5.50 a week for his half week's work. If he applies himself and makes proper progress in the plant, he is advanced 50 cents a week every three months. When he enters a shop full-time as an apprentice he is paid $14.50 a week, and raised $2 every six months, until during the last six months he receives $35 to $37 a week. During his course the employer lays aside a bonus which amounts to approximately $500. This is given only to the boy who finishes his apprenticeship in the school. The weekly hours vary from shop to shop where the boys work, the majority reporting forty-eight hours.

QUALIFICATIONS OF BEGINNERS

Age. It is generally agreed that no one under sixteen years of age should enter upon apprenticeship. Typographia No. 9 of the International Typographical Union to which the compositors who set type in German belong, requires a boy to be seventeen years of age.

Sex. Although this trade is frequently thought of for boys only, there is some opportunity in it for girls also. Women usually do not work at all parts of the trade, but find their greatest usefulness as proofreaders, linotype and monotype operators.

Education. A boy or girl planning to enter the occupation must have at least an eighth grade education. The tendency of the union is to increase this to ninth grade. The Lakeside Press has figures to show that in 1922 two percent of their apprentices were high school graduates and in 1924 ten percent. Some one has said that a compositor "cannot have too broad a general education on account of the wide range of subject matter with which he is called upon to deal."

If a boy is to become a compositor on a foreign language newspaper, he must in addition be able to read and write fluently in the particular language used.

Personal qualities. A boy or girl should have a strong desire to learn the trade, and perseverance enough to carry through the long apprenticeship. Men in the trade say that the beginner should have judgment, responsibility, mental alertness and some artistic taste, for he is concerned with the make-up and appearance of the printed page. In newspaper offices where most of the typesetting is done on the linotype machine, the compositor must sacrifice qualtiy to speed. He must have, therefore, great nimbleness of fingers and be able to work under great pressure.

The compositor must have good eyesight; and he should be in good health, for he works indoors, sometimes at night, and is exposed to certain poisonous substances. Some of these are lead dust from the type cases and scraps of lead from the linotype machine; fumes from the molten lead, especially in the linotype and monotype casting machines; carbon monoxide from the gas burners under the melting pots; and various volatile poisons used in cleaning old type and the machines. In up-to-date establishments, however, where scientific means for ventilation and methods of cleaning have been provided, and where machines have been equipped with the best protective devices, hazards have been reduced to a minimum.

The rules governing apprentices, drawn up by the Typographical Union No. 16 and the Franklin Association, state that applicants for apprenticeship must be in "good health and sound physically." The Chicago Bohemian Typographical Union No. 330 requires a physical examination by a physician, for which one dollar is charged.

THE FIRST STEP

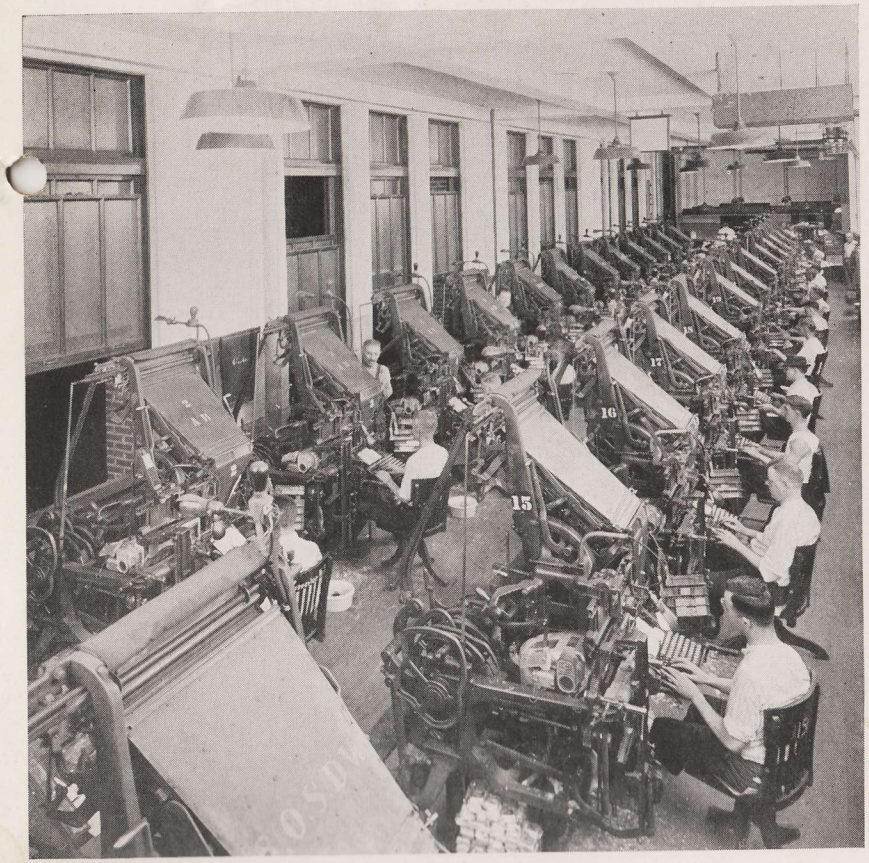
Stay in school as long as you can. The printing industry has room even for college men. A compositor who is a four-year high school graduate has a greater chance for future usefulness than one with less education.

If you know that you want to enter the printing trade and can spend four years in high school in getting a general background, the four-year general language course is probably the best one to take, because it includes those cultural subjects which men in the trade say are so valuable: *foreign languages, history, social studies.* The training in *art* and *mathematics* given in this course is also desirable.

If you have not reached a decision, the print shop in your school is a good place for you to learn more about the occupation. You can take printing courses as electives, and actually do some of the work; in this way you can make up your mind with more certainty as to whether or not you want to become an apprentice when you leave school. The two-year course in printing includes many of the academic subjects which will be of use, such as English, mathematics, and free-hand drawing, although it does not aim to give trade training or shorten the period of apprenticeship.

Men in the trade in Chicago when questioned seemed to think that there has been normal growth in the industry but no scarcity of workers. They stated, however, that there is a place for well-trained men and women. They recommended the trade to those boys and girls qualified and earnest enough to continue through the training period.

FLORENCE CLARK AND LENORE LEINS,
Vocational Advisers.



A Bank of Linotypes in a Newspaper Plant

Acknowledgment for the illustrations used in this booklet is made to R. R. Donnelley & Sons Co. and to The Chicago Tribune.

R. R. Donnelley & Sons Co.:
Cover—Compositors' Marks
The Hand Compositor
The Monotype Operator
Preparing to Lock the Forms

The Chicago Tribune:
The Linotype Operator
A Bank of Linotypes in a Newspaper Plant

SOME BOOKS TO READ

THE COMPOSITOR

The Printing Trades; Indianapolis Vocational Information Series, No. VI. Indianapolis Chamber of Commerce and Indiana University, 1924.

SHAW, FRANK L. *The Printing Trades;* Survey Committee of the Cleveland Foundation, 1916. 95 p. (L19370 16).

THE HISTORY OF PRINTING AND MODERN SHOP PRACTICE

ALDIS, HARRY GIDNEY. *The Printed Book;* Putnam, 1916. 154 p. (K25044).

Describes the beginnings of printing, the spread of the art, the fifteenth century book and the modern book with illustrations.

COCHRANE, CHARLES H. *Modern Industrial Progress;* Lippincott, 1904. 647 p. (609 C64).

Pages 354-387 contain illustrations and descriptions of machines, such as the linotype and monotype.

GRESS, EDMUND G. *American Handbook of Printing;* Oswald Publishing Co., 3rd ed., 1913. 284 p. (K14331).

Over 100 pages are devoted to the compositor. Each chapter is divided into two parts, one giving the history, the other the practices in the shop.

GRESS, EDMUND G. *Art and Practice of Typography;* Oswald Publishing Co., 1917. 160 p. (xP1450).

Part 1 contains facts about the history of printing, including the colonial period.

HENRY, FRANK SOUDLER. *Printing for School and Shop;* Wiley, 1920. 320 p. (K25055).

A textbook for printers' apprentices, continuation school classes, and for general use in schools. Has a chapter on composing-room machines.

HITCHCOCK, FREDERICK H., *ed. The Building of a Book;* Grafton Press, 1906. 375 p. (J2885).

Two chapters are of interest to the compositor. One describes the inventions leading up to the linotype machine; the second, the operation of the monotype machine.

KAEMPFFERT, WALDEMAR BERNHARD. *A Popular History of American Invention;* Scribner, 1924.

Vol. 1, Pt. 2, Chap. 1 contains descriptions of inventions having to do with the "printed word."

REGAN, JAMES LAWRENCE. *Story of Chicago in Connection With the Printing Business;* Regan Printing House, 1912. 224 p. (B7866).

Tells about the beginnings of job printing in Chicago in 1833 and gives brief sketches of leading men in the job and newspaper businesses.

ROCHELEAU, W. F. *Great American Industries;* Book III, Manufactures; A. Flanagan Co., 1900. 222 p. (670 R 58).

For the younger boys and girls. Pages 156-183 describe the processes and progress in printing. Pages 184-207 tell how newspaper printing differs from book printing.

STORIES

FRANCIS, CHARLES. *Printing for Profit;* Charles Francis Press, 1917. 404 p. (K25053).

The first few chapters, written after completing fifty years of printing experience on three continents, tell about the author's early training and later experiences.

LINE, FRANK WOODWORTH, *ed. Benjamin Franklin;* Holt, 1916. 346 p. (B F854 f2).

Colored illustrations by E. Boyd Smith.

HARPER, JOSEPH HENRY. *The House of Harper: A Century of Publishing in Franklin Square;* Harper & Bros., 1912. 690 p. (J2891).

Reminiscences of this publishing house, beginning with the printing apprenticeship of two of the brothers and extending over one hundred years of active service.

OSWALD, JOHN CLYDE. *Benjamin Franklin, Printer;* Doubleday, Page & Co., 1917. 244 p. (C21993).

A biography, which emphasizes the printer and the publisher.

THAYER, JOHN A. *Astir: A Publisher's Life Story;* Small Maynard, 1910. 302 p. (C24513).

The author begins life as a printer, spends some of his early days in Chicago, and finally becomes a magazine publisher.

Note: The numbers in brackets refer to the call numbers at the Chicago Public Library.

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